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# GLOBAL SENSITIVITY APPROACHES FOR MODELS DESCRIBING HIV DISEASE DYNAMICS

Gabriel Dimitriu

Department of Medical Informatics and Biostatistics,
University of Medicine and Pharmacy "Grigore T. Popa",
Iaşi 700115, Romania

gabriel.dimitriu@umfiasi.ro

HIV (Human Immunodeciency Virus) is a virus that attacks cells that help the body fight infection, making a person more vulnerable to other infections and diseases. First identified in 1981, HIV is the cause of one of humanity's deadliest and more persistent epidemics. If left untreated and, without antiretroviral treatment, HIV can lead to the onset of AIDS (Acquired Immunodeficiency Syndrome) – the last stage of HIV infection that occurs when the body's immune system is badly damaged because of the virus. A large variety of mathematical models have been proposed to describe HIV infection and disease dynamics [1, 2, 3, 4, 5, 6, 7].

This talk presents several global sensitivities approaches applied to different models describing Human Immunodeciency Virus (HIV) infection and disease dynamics. The mathematical models defined by ODEs systems describe HIV pathogenesis with cytotoxic T-lymphocytes and infected cells in eclipse phase [1, 2], as well as the disease dynamics by capturing all three stages of infection [7]. The global sensitivity studies are illustrated by graphical objects (sensitivity heat maps, parameter sensitivity spectra), as well as results of the elementary effects method, and active subspace method applied on these models.

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